REMARKS

Reconsideration and allowance of the subject application are respectfully requested. Upon entry of this Amendment, claims 1-24 are pending in the application. In response to the Office Action (Paper No. 11), Applicant respectfully submits that the pending claims define patentable subject matter.

I. Prior Art Rejections

A. Disclosure of Subbiah

Subbiah is directed to an adaptive scheduling method and apparatus to service multilevel Quality of Service (QoS) in AAL2. During AAL2 Negotiation Procedures (ANP), a QoS requirement of each user is obtained either from the user or a computed based on the call setup and is recorded in a ANP memory. After a successful call request negotiation and after a corresponding packet is received by a AAL2 service module, the packet's QoS recorded in the memory is checked. Based on the QoS, the packet is placed into a queue of the AAL2 service module with the same QoS such that a plurality of packets having the same QoS are grouped into the same queue. The packets are transferred from the local peer entity to the remote peer entity based on different QoS requirements.

As shown in Figure 1, a per QoS queuing model includes a multilevel QoS service module 100 at a local peer entity. With regards to a call request-ANP negotiation procedure, the call request is represented by QoS1, QoS2, . . . QoSn with the arrows pointing to a AAL2

module 102. Multiple users, User#1, User#2, . . . User #n send call requests to the multilevel QoS service module 100 for services with its own QoS requirement.

During an AAL2 Negotiation Procedure (ANP) procedure, the local peer entity negotiates with a remote peer entity for a channel assignment to transfer the packet associated with the call request. The remote peer entity either grants the channel assignment, or denies the channel assignment, or gives a waiting period for further negotiation. During the ANP, the QoS requirement of each user is obtained either from the corresponding user or from network QoS, e.g., a user specifies a QoS requirement in its call request. The obtained QoS requirement is stored or updated in an ANP memory table 106 in addition to other information regarding the call request, such as a Channel Identification (CID), a CID status, etc. A QoS parameter may include a delay parameter, a delay variation parameter, and a cell loss ratio parameter, etc. The delay parameter defines a time delay of a packet transmission between the local peer entity and the remote peer entity. The delay variation parameter defines a time delay of transmission between two signals in the packet.

In a QoS queuing procedure, if the ANP is successful, a packet which is associated with the call request is received by the multilevel QoS service module 100 as pointed by an arrow 108. The packet's identification is checked, and its QoS requirement is then obtained from the ANP memory table 106. Based on its QoS information recorded earlier, the packet is placed into an appropriate queue of the service module 100 that closely matches the QoS required by the user. The appropriate queues are created based on an operator specified QoS offerings or based on the demands of the users. Accordingly, the multilevel QoS service module 100 services the

packets by placing the packets into different queues based on the QoS. The packets having the same QoS are grouped into one queue. The packets with a stringent QoS requirement can be serviced faster than the packets with a flexible QoS requirement.

In the multiplexing procedure, the packets packed in the ATM cell are multiplexed. Since ALL2 can be designed to service for low bit rates, the ATM cell is larger than the size of a packet. Accordingly, if the ATM cell is partially filled, the multilevel QoS service module 100 may wait until the cell is filled with some other packets based on the QoS requirement of the packet already in the ATM cell and/or the other packets. A Timer_CU controls the delay time of a packet in the ATM cell based on the QoS requirement of the packet. If the Timer_CU runs out of time, the packet or packets in the ATM cell are transmitted to the remote peer entity. If a QoS of a packet is stringent (i.e. less or no delay), the packet sent to the ATM cell is multiplexed with other packets, if any, already in the ATM cell, outputted to an output Q 110 of the multilevel QoS service module 100, and transmitted to the remote peer entity (or entities) via a ATM connection 112.

B. Disclosure of Petersen, Depelteau, Harth and Gritton

Please the Amendment filed October 30, 2002 for a summary of these references.

C. Analysis

Claims 1, 8-11, 14 and 20-24 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Petersen et al. (USP 5,802,051; hereafter "Petersen") in view of Subbiah et al. (USP 6,538,992;

hereafter "Subbiah"). Claims 2-6 and 15-18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Petersen in view of Subbiah and Depelteau et al. (USP ,6404,767; hereafter "Depelteau"). Claims 12 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Petersen in view of Subbiah, Depelteau and Harth et al. (USP 6,331,981; hereafter "Harth"). Claims 7 and 19 are rejected under U.S.C. § 103(a) as being unpatentable over Petersen in view of Subbiah and Gritton (USP 5,940,397). Applicant respectfully traverses the prior rejections.

By this Amendment, Applicant has independent claims 14, 22, 23 and 24 to recite the "ATM cell transmission times are spaced according to a cell rate negotiated for the corresponding ATM connection and in a way as to keep ATM cell spacing as constant as possible."

With regards to independent claims 1 and 11, Applicant argued in the Amendment filed April 3, 2003 that these claims should be allowable over the combination of Gritton and Petersen because these references do not disclose or suggest a method or apparatus for "scheduling ATM cell transmission times in a way as to keep ATM cell spacing as constant as possible", and "multiplexing a plurality of low bit rate connections into a same ATM connection having the thus scheduled ATM cell transmission times", as claimed. With regards to independent claims 14, 22, 23 and 24, Applicant argued in the Amendment filed April 3, 2003, that these claims should be allowable because the combination of Gritton and Petersen does not teach or suggest "scheduling ATM cell transmission times in a way that as long as there is data available from at least one of said low bit rate connections, ATM cell transmission times are spaced according to a cell rate negotiated for the corresponding ATM connection", as claimed.

The Examiner now maintains that Petersen discloses all of the features of the independent claims except scheduling ATM cell transmission time in a way as to keep ATM cell spacing as constant as possible, which the Examiner asserts is disclosed by Subbiah. Applicant respectfully submits independent claims 1, 11, 14, 22, 23 and 24 would not have been rendered obvious in view of the combination of Petersen and Subbiah. In particular, Subbiah simply teaches a method of scheduling transmission times of ATM cells which is similar to the conventional method discussed on pages 1 and 2 of the present application. That is, Subbiah teaches that if an ATM cell is complete (filled) with packets before the expiration of a delay timer, the ATM cell is sent out immediately; otherwise a partially filled ATM cell is sent out at the expiration of the delay timer (see column 8, lines 39-55).

In Subbiah, the service classes CBR or VBR mentioned at col. 7, lines 59-62 only serve as a basis for QoS differentiation, i.e., for placing packets with the same quality of service (QoS) into a queue corresponding to this QoS (for example, see col. 44, lines 48-50), or for controlling the cell waiting time by the Timer-CU as a function of this QoS (for example, see col. 8, lines 46-48, or col. 9 lines 20-22). However, the solution disclosed by Subbiah remains a solution based on a timer delay, i.e., a solution corresponding to the prior art solution discussed in the application (page 1, line 32 - page 2, line 5).

Accordingly, Applicant respectfully submits that it is quite clear that Subbiah does not teach or suggest scheduling ATM cell transmission time in a way as to keep ATM cell spacing as constant as possible.

Similarly, as the Examiner concedes, Petersen does not disclose scheduling ATM cell transmission time in a way as to keep ATM cell spacing as constant as possible. That is, contrary to the present invention, Petersen is not concerned with the scheduling of transmission times of the ATM cells. Rather, Petersen's object is the preparation of the content of ATM cells noted 940 in Figure 9, in the circumstances by multiplexing of mini-cells, taking into account the respective priorities (as illustrated for example) by the blocks located on the left-hand side of ATM cells 940 in figure 9).

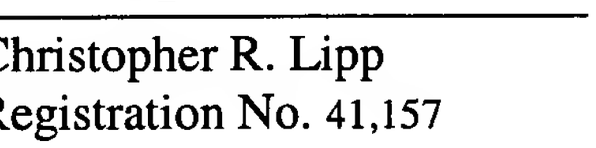
Accordingly, Applicant respectfully submits claims 1-24 should be allowable because the combination of Petersen and Subbiah does not disclose or suggest such a method or apparatus for scheduling of transmission times of such ATM cells, as claimed.

III. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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